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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/099,673	03/14/2002	Baining Guo	M61.12-0396	3032

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EXAMINER

NGUYEN, PHU K

ART UNIT	PAPER NUMBER
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2671

DATE MAILED: 12/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/099,673

**Applicant(s)**

GUO ET AL.

**Examiner**

Phu K. Nguyen

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-9,11-15,17 and 19-22 is/are rejected.
- 7) ☒ Claim(s) 4,10,16,18 and 23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 3, 5, 8, 11, and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by SUTTON et al. (US 6,539,354).

As per claim 1, Sutton teaches the claimed "computer readable medium having instructions, which when executed on a computer provide a user interface" (Sutton, column 15, lines 34-45; Sutton teaches the software for generating the multimedia output), the instructions comprising: "a speech synthesizer receiving input for synthesis and providing an audio output signal" (Sutton, column 16, lines 53-56; Sutton teaches the synthesizing of the input text into the audio output signal); and "a video rendering module receiving information related to the audio output signal, the video rendering module rendering a representation of a talking head having a talking state with mouth movements in accordance with the audio output signal " (Sutton, column 16, line 57 to column 17, line 3; Sutton teaches the receiving of the synthesized audio signal and the generation of the talking head according to the input text) and "a waiting state with movements in accordance with listening" (Sutton, column 14, lines 18-39; Sutton teaches the facial expression such as smile, grin, jaw down, representing the movements in accordance with listening while not speaking).

Claim 2 adds into claim 1 “the video rendering module renders a sequence of video frames having the talking head” (Sutton, column 15, lines 7-11, 20-33; column 19, lines 5-8; Sutton teaches the generation of video frames according to the synthesized speech).

Claim 3 adds into claim 2 “the video rendering module continuously renders the video frames having the head with non-talking mouth movements during the waiting state” (Sutton, column 14, lines 18-39; Sutton teaches the facial expression such as smile, grin, jaw down, ... representing the non-talking mouth movements while not speaking or in waiting state), and “adds a talking mouth position to each of the frames during the talking state” (Sutton, column 7, lines 10-18; Sutton teaches the modification of viseme (i.e., the visual speech representation or mouth pattern) in the mouth position for each speaking word in combination with the head/body gestures).

Claim 5 adds into claim 3 “the video rendering module tracks movements of the talking head in the sequence of video frames” which Sutton teaches in the tracks of the talking head’s movements (Sutton, column 14, lines 23-27).

Claim 8 adds into claim 5 “the talking mouth positions are added based upon interpolated physical movements of the talking head” which Sutton teaches in the

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combining the mouth shape (e.g., visemes) with the body/head movements (column 14, lines 18-27).

17. A computer-implemented method for generating a talking head on a computer display to simulate a conversation, the method comprising: continuously rendering a sequence of video frames of a talking head with each frame having mouth characteristics indicative of a non-talking state; tracking movements of the talking head throughout the sequence of video frames; outputting a voice audio; and selectively adding a corresponding mouth position to selected frames of the video sequence as a function of the voice audio and tracked movements of the talking head.

Claim 17 claims a method based on the computer program of claim 11; therefore, it is rejected under the same reason.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6, 7, 9, 12, 13, 14, 15, and 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over SUTTON et al. (6,539,354) in view of SCOTT et al. (6,097,381).

Claim 6 adds into claim 5 "the video rendering module transforms affine parameters to physical movements of the talking head for each frame" which Sutton does not teach. However, Scott teaches that the use of affine parameters in head

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movements is well known in the art (Scott, column 16, line 54 to column 17, line 1; Scott teaches the uses of affine transformations involving transformation coefficients to adding the head movement while talking). It would have been obvious at the time the invention was made, in view of the teaching of Scott, to configure Sutton's method as claimed by using the affine transformation to add the small movements to the head while speaking. The purpose to use the affine transformation to implement the head movement while talking is for a more realistic change in perspective (Scott, column 16, line 65 to column 17, line 1) and the simplification of an affine transformation involving the multiplication of the transformation matrix with its corresponding affine coefficients.

Claim 7 adds into claim 6 "the physical movements include translations and rotations of the talking head" which Sutton does not teach. However, Scott teaches that the physical movements of a talking head such as translations, rotations are well known in the art (Scott, column 16, lines 59-60; Scott teaches the affine transformations such as offset (translation), rotation). It would have been obvious at the time the invention was made, in view of the teaching of Scott, to configure Sutton's method as claimed by using the affine transformation to add the small movements such as translation, rotation to the head while speaking. The purpose to use the affine transformation such as translation, rotation to implement the head movement while talking is for a more realistic change in perspective (Scott, column 16, line 65 to column 17, line 1) and the simplification of an affine transformation of translation, rotation, scale, ... involving the multiplication of the transformation matrix with its corresponding affine coefficients.

Claim 9 adds into claim 6 “for each of a plurality of frames, interpolated physical movements are calculated as a function of a corresponding preceding frame and a corresponding succeeding frame” which Sutton does not teach. However, Scott teaches that the interpolation of the physical movements between the key frames is well known in the art (Scott, the generation of the animation frames using the linear interpolation of the key frames for the rotation and translation of the head , column 17, lines 15-37). It would have been obvious at the time the invention was made, in view of the teaching of Scott, to configure Sutton’s method as claimed by using the key frames to generate the interpolated physical movements in the animated frames. The purpose to use the interpolation of key frames to generate the animation frames is for a more realistic change in animation (Scott, non-linear interpolation, column 17, lines 30-37, 60-63) and the reduction of the calculation for using only simple interpolation of data between the key frames.

As per claim 11, Sutton teaches the claimed “computer readable medium having instructions, which when executed on a computer provide a user interface” (Sutton, column 15, lines 34-45; Sutton teaches the software for generating the multimedia output), the instructions comprising: “a speech synthesizer receiving input for synthesis and providing an audio output signal” (Sutton, column 16, lines 53-56; Sutton teaches the synthesizing of the input text into the audio output signal); and “a video rendering

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module receiving information related to the audio output signal, the video rendering module rendering a representation of a talking head having a talking state with mouth movements in accordance with the audio output signal " (Sutton, column 16, line 57 to column 17, line 3; Sutton teaches the receiving of the synthesized audio signal and the generation of the talking head according to the input text); "a waiting state with movements in accordance with listening" (Sutton, column 14, lines 18-39; Sutton teaches the facial expression such as smile, grin, jaw down, representing the movements in accordance with listening while not speaking); "the video rendering module accessing a store having a sequence of frames of the talking head" (Sutton, column 15, lines 7-11, 36-38; column 19, lines 5-8; Sutton teaches the generation of video key frames using the morphing technique according to the synthesized speech with the stored visemes ), "continuously rendering at least a portion of each of the frames in the sequence of frames while selectively adding a corresponding mouth position for the talking state to each of the frames " (Sutton, column 7, lines 10-18; Sutton teaches the modification of viseme (i.e., the visual speech representation or mouth pattern) in the mouth position for each speaking word) in accordance with the audio output signal and in accordance with tracking movements of the talking head during the sequence of frames (Sutton teaches in the tracks of the talking head's movements; column 14, lines 23-27).,

Claim 12 adds into claim 11 "the video rendering module transforms affine parameters to physical movements of the talking head for each frame" which Sutton does not teach. However, Scott teaches that the use of affine parameters in head



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movements is well known in the art (Scott, column 16, line 54 to column 17, line 1; Scott teaches the uses of affine transformations involving transformation coefficients to adding the head movement while talking). It would have been obvious at the time the invention was made, in view of the teaching of Scott, to configure Sutton's method as claimed by using the affine transformation to add the small movements to the head while speaking. The purpose to use the affine transformation to implement the head movement while talking is for a more realistic change in perspective (Scott, column 16, line 65 to column 17, line 1) and the simplification of an affine transformation involving the multiplication of the transformation matrix with its corresponding affine coefficients.

Claim 13 adds into claim 12 "the physical movements include translations and rotations of the talking head" which Sutton does not teach. However, Scott teaches that the physical movements of a talking head such as translations, rotations are well known in the art (Scott, column 16, lines 59-60; Scott teaches the affine transformations such as offset (translation), rotation). It would have been obvious at the time the invention was made, in view of the teaching of Scott, to configure Sutton's method as claimed by using the affine transformation to add the small movements such as translation, rotation to the head while speaking. The purpose to use the affine transformation such as translation, rotation to implement the head movement while talking is for a more realistic change in perspective (Scott, column 16, line 65 to column 17, line 1) and the simplification of an affine transformation of translation, rotation, scale, ... involving the multiplication of the transformation matrix with its corresponding affine coefficients.

Claim 14 adds into claim 13 "the talking mouth positions are added based upon interpolated physical movements of the talking head" which Sutton teaches in the combining the mouth shape (e.g., visemes) with the body/head movements (column 14, lines 18-27).

Claim 15 adds into claim 14 "for each of a plurality of frames, interpolated physical movements are calculated as a function of a corresponding preceding frame and a corresponding succeeding frame" which Sutton does not teach. However, Scott teaches that the interpolation of the physical movements between the key frames is well known in the art (Scott, the generation of the animation frames using the linear interpolation of the key frames for the rotation and translation of the head , column 17, lines 15-37). It would have been obvious at the time the invention was made, in view of the teaching of Scott, to configure Sutton's method as claimed by using the key frames to generate the interpolated physical movements in the animated frames. The purpose to use the interpolation of key frames to generate the animation frames is for a more realistic change in animation (Scott, non-linear interpolation, column 17, lines 30-37, 60-63) and the reduction of the calculation for using only simple interpolation of data between the key frames.

Claims 19-22 claim a method based on the computer program of claims 12-15; therefore, they are rejected under the same reason.

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Claims 4, 10, 16, 18, and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

In claims 4, and 18, the allowable feature is “wherein continuously rendering includes returning to an earlier, pre-selected frame in the sequence upon reaching a selected frame in the sequence.”

In claims 10, 16, and 23, the allowable feature is “adding a mouth position corresponding to the talking state is added as a function of the physical parameters of the frame if a difference in at least one of physical parameters between the frame and the corresponding interpolated physical parameter exceeds a selected threshold, whereas if the difference in at least one of physical parameters between the frame and the corresponding interpolated physical parameter does not exceed the selected threshold, the mouth position corresponding to the talking state is added as a function of interpolated physical parameters.”

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phu K. Nguyen whose telephone number is (703)305 - 9796. The examiner can normally be reached on M-F 8:00-4:30.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman can be reached on (703)305-9798. The fax phone

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number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Phu K. Nguyen  
December 1, 2004

  
PHU K. NGUYEN  
DECEMBER 1, 2004  
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